

MEMORANDUM FOR SEE DISTRIBUTION

FROM: HQ AFCESA/CEOT
139 Barnes Drive Suite 1
Tyndall AFB FL 32403-5319

SUBJECT: Engineering Utilization and Training Workshop (U&TW) Minutes

1. **PURPOSE:** To review and align AFMAN 36-2108 with the Career Field Education and Training Plan (CFETP), determine true 3-level student training requirements, Career Development Course (CDC) requirements, verify/identify core tasks, identify Mission Ready Airman (MRA) requirements, and review advanced courses to meet the future training needs for the career field.

2. **LOCATION:** 366 Training Squadron, Det 7, Ft Leonard Wood MO

3. **DATES:** 24 – 28 July 2000

4. **ATTENDEES:** SMSgt Randall Skinner, HQ AFCESA/CEOT, chaired the workshop. See Attachment 2 for list of attendees.

5. **SUMMARY:** Modify CFETP to meet existing requirements and align 3/5/7-level training requirements to match. Verify/identify cores tasks and identify future training needs for the Engineering career field through supplemental training.

6. **DISCUSSION:**

a. Major Smith, 366 TRS/CC, opened the workshop by welcoming all attendees and pointed out the significance each member will play in this workshop.

b. U&TW Charter/Agenda/Rules of Engagement/Introductions: SMSgt Randall Skinner briefed attendees on the U&TW step-by-step process for voting. He pointed out the significance of each member's input and the importance of their integrity in defining 3/5/7-level training requirements for this career field as the voting members. SMSgt Skinner stressed to the ten voting members that regardless of their experience, their vote counts and determines the final outcome for training. The focus for this workshop is on the wartime contingency requirements only. He cautioned the members to determine true training requirements and to not allow the concern for resources to affect their decisions at this point. Also, SMSgt Skinner encouraged members to have supporting data when making suggestions to the CFETP; and he reviewed the 5-day workshop agenda with accompanying procedural remarks.

c. How Goes It Briefing & Tour of Training Facilities: Mr. Dave Harrington and MSgt Tommy Peacock, 366 TRS, Det 7, provided insight into current courses, answered questions, and gave a tour of the schoolhouse's facilities.

d. CE Craftsman 7-Level Course Briefing: CMSgt Joe B. Wallace, 366 TRS/CCM, provided an overview, via power point presentation, for the 7-level course. He gave a brief history of how it came to be, selection process for attending, and the importance of all attendees meeting the prerequisites before attending. The 7-level course is intended to be a finishing course in technical expertise and management skills for final upgrade. He emphasized that civil engineers must have ALL core tasks and read-ahead completed prior to attending any 7-level course. He also stated that in order to attend 7-level, personnel are rated by rank and time in upgrade training. He explained that when personnel are unable to attend class, it most always results in a lost slot that cannot be filled. When there is a no show, AFPC is always notified so they access the system to find another body. However, by the time a name is generated, the course is into the second day and the slot remains vacant. CMSgt Wallace provided details of the 7-Level Review Committee and discussed how the new course will be taught and what resources and equipment will be used. In conclusion, CMSgt Wallace explained how new technology would be used to teach common core tasks (line items 1 through 10) via Computer Based Instruction (CBI).

e. Community College of the Air Force (CCAF) Briefing: TSgt James Dinsmoore, AETC, gave a basic briefing on the courses available and the process for gaining additional course approval in the CCAF program. The catalog is revised every two years and he advised members to take advantage of the opportunity to make changes to the degree program at this time. He provided statistical data revealing the numbers of Engineering personnel who have accomplished the CCAF requirements. He also encouraged members to impress upon their folks the opportunity and the benefit of receiving a degree in Engineering through the CCAF.

f. Occupational Measurement Squadron (OMS) Briefing: 1st Lt Andrew Hosler, AFOMS/OMYO, gave the Air Force OMS briefing that is used to evaluate each career field every 3-5 years via occupational data collection through the analysis of surveys. The occupational measurement provides an analysis that serves as a foundation for the process of determining career-level progression, job satisfaction, plans of instruction, and tasks actually being performed by civil engineers. This data is used as a foundation for the process of determining the 3/5/7-level wartime tasks and training requirements, as well as providing data to show actual jobs performed. Not all members are eligible to respond. There were 466 tasks in the Engineering career field measured. Throughout the week, Lt Hosler provided good data to support the U&TW process.

g. AEF and EAF: CMSgt Michael Doris gave a presentation on EAF and AEF. He related the relevance of the contingency concept to the civil engineer and the Engineering AFS. He presented a power point visual aid to enhance the TOTAL FORCE Employment Concept. The end result is 10 AEFs, on a 15-month rotation cycle, with a 90-day vulnerability force structure capable of supporting all operational taskings. The current stats show that approximately 900 civil engineers are on call per AEF to fill roughly 740 steady state taskings in the field.

7. **Closing Remarks:** SMSgt Skinner thanked the attendees for their participation and professionalism, which made this U&TW a great success. The workshop adjourned at 1430 on 28 July 2000.

MYRL KIBBE, CMSgt, USAF
Chief, Training Division

Attachments:

1. Distribution List
2. Attendees
3. Changes to AFMAN 36-2108
4. Recommendation to change ASVAB entry requirements
5. Changes to STS
6. Supplemental Course Changes
7. Action Items
8. Overall U&TW Results

DISTRIBUTION LIST

HQ ACC/CEOS
HQ AETC/CEOX/CEOG
HQ AFMC/CEPR
HQ AFRC/CEXR
HQ AFSPC/CEPX
HQ AFSOC/CEX
HQ AIA/XPCS
HQ AMC/CEOG
HQ ANG/CEXE
HQ PACAF/CEOG
HQ USAFA/CCET
HQ USAFE/CEXOS
11 CES/CCQT
HQ USAF/ILEX/ILEM
366 TRS/CC/TRR/TTE

July 00 U&TW Attendees

Engineering AFS

MAJCOM	NAME/RANK	BASE	COMMENTS
ACC	TSgt Dawn Lea Kuehn	Dyess AFB, TX	Voting mbr
HQ AFCESA	SMSgt Randall Skinner	Tyndall AFB FL	Chairman
ANG	MSgt William J. Pullar	105 CES	Voting mbr.
AFMC	MSgt Craig E. Henry	Robbins AFB, GA	Voting mbr
AFRC	MSgt Howard E. Bentley	455 CES	Voting mbr
AFMC	TSgt Lemuel L. Campbell	WRALC	Non-Voting Mbr
ACC	MSgt John A. Michalik	Silver Flag, Tyndall	Non-Voting Mbr
AFRC	TSgt John Sanchez	944 CES	Non-Voting Mbr
	1Lt Andrew K. Hosler	AFOMS	Non-Voting Mbr
ACC	CMSgt Robert N. Niswanger	509 CES	Non-Voting Mbr
AETC	Mr. David E. Harrington	366 TRS/DET 7	Non-Voting Mbr
AETC	TSgt Rodney D. Humphrey	366 TRS/DET 7	Non-Voting Mbr
11 th Wing	TSgt Tracy W. Johnson	Bolling AFB, DC	Voting Mbr
USAFE	SSgt George A. Waring		Voting Mbr
AMC	TSgt David Sosa	Scott AFB, IL	Voting Mbr
HQ AETC	Capt Anthony Copeland	Randolph AFB	Logistics
Pentagon	CMSgt Michael S. Doris	Washington DC	Chief Enlisted Matters (CE)
AFRC	CMSgt Susan K. Wynn	HQ AFRC/CEXR	Training Manager
366th	CMSgt Joe B. Wallace	Sheppard AFB TX	Non-Voting Mbr
	MSgt Wm Brad Staples	AFSPC	Voting Mbr
PACAF	SMSgt Raymond F. Allen III	HQ PACAF/CEOS	Voting Mbr
AFSOC	SMSgt Keith D. Ogles	16 CES	Voting Mbr
AETC	CMSgt Brian G. Grau	366 TRS/CCM	Non-Voting Mbr
366 th TRS	Mr. Glenn Moret	Sheppard AFB TX	Training Manager
366th	Mr. Stephen Smith	Sheppard AFB TX	Manpower
AETC	Pat Thompson	366 TRS/DET 7	Non-Voting Mbr
AETC	MSgt Tommy Peacock	366 TRS/DET 7	Non-Voting Mbr
AETC	SSgt Scott English II	366 TRS/DET 7	Non-Voting Mbr
CCAF	TSgt James S. Dinsmoore	Maxwell AFB, AL	Non-Voting Mbr

CEM Code 3E000
AFSC 3E591, Superintendent
AFSC 3E571, Craftsman

Journeyman AFSC 3E551
Apprentice AFSC 3E531
Helper AFSC 3E511

ENGINEERING

(Draft-Changed 28 Jul 00)

1. Specialty Summary. Directs and performs civil engineering design, drafting, surveying, and contract surveillance to support Air Force facility construction and maintenance programs. Prepares manual and Computer Aided Design (CAD) drawings, specifications, and cost estimates. Develops, operates, and maintains Geographic Information System (GIS) modules. Utilizes surveying technology to include Global Positioning System (GPS). Evaluates potential construction sites and performs field tests on soils, asphalt, and concrete. Related DoD Occupational Subgroup: 412.

2. Duties and Responsibilities:

2.1. Develop engineering designs. Use CAD software. Prepare cost estimates, performance work statements, and specifications for existing and proposed facilities. Design concrete and asphalt pavements. Perform simple load calculations for horizontal and vertical construction. Act as liaison between design, review, construction, and using agencies.

2.2. Perform drafting duties. Interpret rough engineering sketches to produce working drawings using manual and CAD techniques. Produce architectural, structural, civil, mechanical, and electrical drawings. Update Base Comprehensive Plans (BCP) and maintains record drawings. Plot and reproduce drawings.

2.3. Perform GIS duties. Link computerized maps to databases displaying detailed information via the web. Create geographic coverages. Develop database structures. Create and populate feature codes. Link graphical data to relational databases. Develop query routines for end-user applications.

2.4. Perform surveying duties. Conduct reconnaissance, site location, construction, and mapping surveys while operating manual and electronic surveying equipment. Collect, convert, and present field survey data for civil engineering projects. Maintain equipment.

2.5. Perform contract management duties. Manage and inspect construction and maintenance contracts. Interpret plans, specifications, and other contract documents. Coordinate, evaluate, monitor, and document contract activities and progress. Prepare recommendations for contract modifications. Review material submittals for compliance with contract specifications. Conduct pre-final, acceptance, and post acceptance inspections. Manage warranty and guarantee programs.

2.6. Perform standardized and expedient tests on soils, asphalt, and concrete. Collect, record, and interpret test data. Prepare reports for engineering evaluation.

2.7. Support contingency operations. Develop beddown plans to house personnel, aircraft, and associated support functions during contingency operations. Evaluate existing airfield pavements, lighting, navigational aids, markings, and arresting systems. Perform recovery operations to include explosive ordinance reconnaissance, airfield damage assessment, minimum operating strip selection, rapid runway repair calculations, and airfield marking procedures.

3. Specialty Qualifications:

3.1. Knowledge. Knowledge is mandatory of computer operations and software application; mathematics, including algebra, geometry, and trigonometry. Knowledge is desirable in surveying and drafting, engineering and contracting regulations, plans and specifications, and environmental and safety hazards and concerns.

3.2. Education. For entry into this specialty, completion of high school or general educational development equivalency, with courses in algebra, geometry, trigonometry, and computer operations and software application is mandatory. Completion of high school courses in drafting, physics, and chemistry is desirable.

3.3. Training. The following training is mandatory for award of the AFSC indicated:

3.3.1. 3E531. Completion of Engineering Apprentice course.

3.3.2. 3E571. Completion of Civil Engineer Management Craftsman course.

3.4. Experience. The following experience is mandatory for award of the AFSC indicated:

3.4.1. 3E551. Qualification in and possession of AFSC 3E531. Also, experience in functions such as drafting, surveying, and contract inspection.

3.4.2. 3E571. Qualification in and possession of AFSC 3E551. Also, experience performing or supervising functions such as surveying, drafting, materials testing, and contract inspection.

3.4.3. 3E591. Qualification in and possession of AFSC 3E571. Also, experience directing functions such as surveying, materials testing, drafting, and contract management.

3.5. Other. The following are mandatory for entry into this specialty:

3.5.1. Normal color vision as defined in AFMAN 48-123.

3.5.2. Qualification to operate government vehicles according to AFI 24-301.

POSITION PAPER
ON
THE NEED TO RAISE ASVAB REQUIREMENTS
FOR ENGINEERING ASSISTANT (3E5X1) CAREER FIELD

Submitted with the AFI 36-2108 recommended changes

1. OBJECTIVE. This paper covers the imperative need, in the opinion of the July 2000 Utilization and Training Workshop members, to raise the entry-level ASVAB requirements to enter the Engineering Assistant (EA) career field (3E5X1). The Air Force in general is embracing current technological advancements to carry out our ever-evolving missions within the Continental United States and abroad, in times of peace and worldwide contingencies. The EA career field is no exception. Within the past few years, the role of the EA has evolved into the point guard position for engineering operations. As draftsmen, surveyors, contract managers, construction inspectors, preliminary designers, force beddown experts, construction cost estimators, crash survey analysts, Geographic Information System administrators, force protection system designers, airfield repair specialists, to name a few, the EA field has become the most diverse and in-demand technician corps within the enlisted CE community. Technological advancements within the multi-disciplined engineering field have increased the demand for people with superior math, computer, administrative, communicative, and engineering technical skills than ever before. The days of personnel with only basic mathematical capacities and knowledge in drafting are over. We rely on first-term airmen to fulfill the roles mentioned on an ever-increasing basis. The following dialogue goes into much greater detail the demands placed on EAs and the need to recruit people capable of answering those diverse demands.

2. Current Peacetime Operations (positions filled)

a. Drafting – Airmen entering the EA career field perform drafting duties to include translating professional engineer's rough sketches into working drawings. These drawings, whether accomplished manually or by computerized means, must accurately depict the needs of our users that will, in-turn yield usable, maintainable, reliable facilities usually with stringent time constraints. In most cases, these drawings become legal binding documents between the United States government and private contractors and little to no error is allowed. Any deficiencies or errors in these drawings will inevitably lead to contract award delays, construction delays and most certainly will produce the need for costly contract modifications. Master Plans and Record Drawings are other critical drawings that must be maintained to a high degree of accuracy and clarity and also necessitate a firm grasp of engineering terminology and drafting skills. Errors and omissions on these documents negatively affect in-house daily scheduled work, future design, capitalization, real property management, disaster preparedness, and airfield operations.

Current Situation – although our entry-level requirements state: “knowledge in drafting” is “desirable”, many entry-level trainees possess little to no skills. The argument can be made that drafting can be taught through formal and up-grade training. Although it’s a true statement, it denies the fact that to be a proficient draftsman, one must have the mental capacity to envision a facility throughout its construction or renovation phases and not drawn by the numbers. The current technical school graduates cannot grasp engineering principles and subsequently require constant supervision throughout a great portion of their first enlistment – even after painful hand-in-hand training and guidance through career development courses.

b. Surveying – this is one of the most critical uses for EAs in today’s Air Force. Although we’re increasingly outsourcing a good portion of extensive land surveying, the Air Force still relies quite heavily on EAs to perform topographical, utility profile, and numerous other forms of real estate definition. Errors in this area can lead to inaccurate depictions of Air Force property and site conditions critical to vital operations such as new construction, disaster preparedness, and airfield operations.

Current Situation – as with drafting skills, our entry-level requirements state: “knowledge in surveying” is “desirable.” Again, many entering the field possess little to no skills. A similar argument can be made that surveying can be taught through formal and up-grade training. Although this is a true statement, it also denies the fact that to be a proficient surveyor one must have the mental capacity to capture the theories and purposes of land surveying. This requires a great deal of imagination potential, as well as an analytical mind to interpret data obtained with highly sensitive and complex equipment into graphic imagery through the use of trigonometric applications. The current technical school graduates cannot grasp engineering principles and subsequently require constant supervision throughout a great portion of their first enlistment – even after painful hand-in-hand training guidance through career development courses.

c. Contract Management - another critical role EAs fill is that of contract manager. We are responsible for oversight of critical contracted services for AF installations. We write, aid in negotiation and perform surveillance of base maintenance contracts such as base refuse collection, base-wide custodial, grounds maintenance, special equipment maintenance (elevators, fire alarm systems, hoists, etc.), and many other non-personal services. EAs are responsible for these contracts from cradle-to-grave and serve as the Functional Area Chiefs on behalf of the Base Civil Engineer. Tasks associated with these duties include writing statements of work, preparing detailed costs estimates, establishing inspection schedules, monitoring customer complaints, evaluating contractor compliance, and interfacing with contractors throughout contract periods.

In addition to service contract management, EAs manage in-house civil engineering work and determine when minor and major construction, repair, and demolition work will be accomplished via contracted services. Once the determination is made that work is to be accomplished via contract, EAs prepare statements of work, develop detailed government cost estimates, and aid in the contracting award process.

Once contracts are awarded, EAs manage work regardless of method of completion. Whether performed via “one time” contract, Simplified Acquisition Base Engineer Repair (SABER), Military Construction (MILCON), Army Corps of Engineers, or any other chosen method, EAs manage these contracts performing routine inspection ensuring all standards of construction (both military and industry) are met and ensure the government gets the best construction value. In many instances, EAs accomplish all preliminary design work for these contracts.

Current Situation - This role requires EAs to possess highly developed negotiation skills, effective communicative skills, meticulous administrative skills, and extensive knowledge in construction practices. These skills take long stretches of time, concentrated dedication and the capacity to learn all the multifaceted disciplines of construction including materials testing. The current technical school graduates lack many of these qualities leaving critical work to be performed by senior ranking EAs.

3. Contingency Roles – (positions filled)

In many of our contingency roles, EAs usually become the “engineers” or, at minimum, engineers right-hand persons. Although we are primarily responsible to survival recovery center and damage control center commanders for Base Recovery After Attack and Minimum Operating Strip Selection, our recent taskings have encompassed many other roles requiring quick analytical thinking and problem-solving skills. We must be expedient construction method experts able to exploit limited resources.

a. Emergency relief for natural disasters – whether a tornado, flood, earthquake or any other act of God, we are responsible for damage assessment, cost estimates, and resource management to repair any situation both short term and permanently.

b. Humanitarian Efforts and Force Beddown – we are needed as technical experts for bedding down refugees, victims of evacuation, or contingency reception. EAs must have a firm knowledge of all resources available to build tent cities using Harvest Eagle, Falcon or Bear assets to create functional “cities” while restoration of more permanent facilities can be performed.

c. Crash Surveying – EAs are called upon to assist in safety investigations for aircraft mishaps. Once on site, they complete a series of traverses, topographical surveys, and maps to aid in diagnosing the cause of the incident. A firm grasp of surveying as well as an ability to recognize certain aircraft components is critical.

d. Force Protection Planners – in forwardly deployed locations as well as main non-CONUS bases, EAs are required to prepare plans to reduce personnel, aircraft and asset vulnerability. Knowledge in force protection engineering principles, assets, configurations and risk assessment is of the essence.

e. Airfield Analysis and Maintenance – EAs can and have been tasked to enter aid in occupying operating bases where the airfield and facility conditions are unknown. They assess every aspect of an airfield including lighting, surface, arresting systems, NAVAIDS, and

adjacent infrastructure for repair ability, maintainability and operability. A vast knowledge of expedient repair and restoration engineering is crucial for the success of such operations.

Current Situation – Never in the history has a demand such as this been placed on our first-term airmen within this career field. Throughout Air Expeditionary Force (AEF) locations, our young airmen are being tasked with these critical responsibilities and in many instances training must be conducted repeatedly while on site. Our NCOs and SNCOs end up being the “super technicians” instead of supervisors and managers as outlined in our career structure. A high percentage of our airmen, though expulse admirable effort, simply do not have the capacity to grasp some of our simplest tasks.

4. New Technology Being Employed

As one can imagine after reading the roles, contingency and others, associated with this career field, it’s logical to assume that the Air Force has and continues to exploit technological advances to keep an edge in this fast-paced profession. This career field is one great venue for automation to prove its value. Developments such as Computer Aided Design (CADD), Global Positioning Systems (GPS), Geographic Information Systems (GIS) and countless devices for electronic surveying have found there natural home in this career field. Not only do we require airmen to become rapidly proficient and comprehensive with the theories and applications of engineering principles, we provide state-of-the-art complicated computerized equipment with which to apply them.

Airmen EAs are required (core tasks) to complete computerized drawings within minimal time of their first duty station; most colleges teach series upon series of specialized training for this one operation. Additionally, we not only require them to know plane surveying (yet another vast field) manually, GPS equipment in concert with electronic surveying equipment allows for unprecedented precise data to be collected and manipulated to transform into useful engineering specifications. Already underway, the technology offered by GIS is the future for all DoD record drawing management, base infrastructure management, real property management, map production and manipulation, and installation engineering. Our airmen will need a firm grasp on computer operating systems, data base management, and data manipulation, all in addition to the aforementioned skills. Our current entry-level requirements do not suffice.

5. Limitations of Current Requirements

a. Reduction of Minimum Requirements – approximately four years ago, recruitment efforts reduced the entry-level requirements for this and many other career fields in the Air Force. Since then, the ECI Course Analysis Reports have shown a steady decline in end of course exam scores for all career development courses. The same data shows an increase in first and second time failures for the same. We seemingly decreased entry qualifications and continue to increase training demands, performance standards and core tasks.

b. Remediation Requirements at the Technical School – Our technical school (Ft Leonard Wood MO) has had to invest an unprecedented amount of remediation to help maintain Air

Force graduation demands. The school instructors attest to the increased remediation trends in the entry course and advanced courses within the past four years.

c. Demands on Trainers - a random telephone survey conducted with several bases (CONUS and overseas) revealed trainers are spending on average four to eight after duty hours weekly to get trainees to minimum passing score competence.

d. CDC Failure Rate and Graduate Scores – at first glance, the graduate scores reported by ECI Course Analysis Reports (00 – Jul) do not seem all that alarming. However, a deeper analysis of the data reveals a significant deficiency in aptitude of 5-skill level applicants. Although large percentages are passing, average passing scores are a mere 7% above minimum standards.

First Time Failure Rate	12%
Second Time Failure Rate	13%
Overall Course Failure Rate	2%
Average Graduate Scores	77%

f. Task Competence, Requalification, Repetition of Recurring Training, and Repetition of Home-based Training – in all these training areas, trainers throughout the Air Force are expressing the need to repeat training excessively for airmen to become proficient.

6. Summary

As diverse and technically demanding as the Engineering Assistant AFS (3E5X1) is, one can understand that requirements should be among some of the highest in the Air Force or at least require a wide range of competencies for a recruit to demonstrate an aptitude. With technology ever increasing the complexity of day-to-day and contingency operations, we need an arsenal of computer literate, engineering minded, mathematically versed, mechanically inclined, communicatively skilled, and analytically minded people with the potential to be challenged with the roles defined in the main text of this report. Administrative skills go hand in hand with all previously stated requirements. The EA field is in the forefront of all AEF initiatives and a critical enabler of our peacetime infrastructure management. Ironically enough, the following are the current aptitude entry-level requirements:

Aptitude Area	Score Required for Entry
Mechanical	0
Administrative	0
General	48
Electrical	0

*From AFMAN 36-2108

It is the recommendation of the EA Utilization and Training Workshop 2000 voting members to consider raising the ASVAB entry-level requirements. This career field encompasses a large piece of the Air Force mission and we recommend placement of the right people in this demanding job.

The consensus at the workshop seemed to be simply this: whoever is responsible for assigning aptitude scores must have an empirical way to decide scores based on tasks performed and knowledge required.

1. General score should be raised to what it was previously (60's from what I can dig up)
2. Some mechanical and electrical requirements should apply (new requirement).

Please perform the required research to determine the appropriate ASVAB scores for this AFS.

RANDALL K. SKINNER, SMSGT, USAF
AF Career Field Manager

DRAFT

This is not an interim change. This document is a reflection of the recommended changes from the July 00 U&TW. They will be included in the new 3E5X1 CFETP. Do not use this information to make changes to your current 1997 CFETP.

Task Knowledge and Technical References	Core Task	3- level Trng		5- level Trng	7-level Trng	
		(1) Course	(2)	(1) CDC	(1) RAM	(2) Course
1. CE ORGANIZATION AND CAREER FIELD STRUCTURE TR: AFDD 2-4.2; AFIs 10-209, 10-210, 10-211, 32-1001, 32-1022, 32-1031, 36-2101, 38-101, 51-903; AFMAN 36-2108; AFPAM 32-1004 v.1; War & Mobilization Plan (WMP)-1, Annex S						
1.1. Base Civil Engineer (BCE) structure		A		B		
1.2. Progression in career ladder		A		B		
1.3. Duties and responsibilities						
1.3.1. Peacetime		A				
1.3.2. Contingency		A				
1.4. Functions of:						
1.4.1. BCE		A		B	B	
1.4.2. Prime BEEF		A		B	B	
1.4.3. RED HORSE		A		B	B	
1.4.4. HQ ANG/AFRC		A		B	B	
1.5. Resources						
1.5.1. Assess manpower requirements					b	3c
1.5.2. Identify budget requirements					b	3c
1.5.3. Determine equipment requirements					b	3c
1.5.4. Use Allowance Standards (AS)					b	3c
1.5.5. Research, Development, and Acquisition (RD&A) TR: DoDD 5000.1						
1.5.5.1. Process						B
1.5.5.2. Unit responsibilities						B
1.5.5.3. Major command responsibilities						B
1.5.6. Assess vehicle requirements					b	1b
1.5.7. Requesting contract services					b	2c
1.5.8. Requesting Simplified Acquisition of Base Engineering Requirements (SABER) contract					B	C

1.5.9. Management Equipment Evaluation Program (MEEP)						
2. SPECIFIC OPSEC VULNERABILITIES TR: AFI 10-1101		A				
3. PRACTICE COMPUTER SECURITY TR: AFSSI 5100		A			A	1b
4. SUPERVISION TR: AFMAN 36-2108; AFIs 36-2201, 36-2403, 36-3104; AFPAM 36-3627; AFP 35-49; DoDD 5500-7						
4.1. Orient new personnel					b	
4.2. Assign personnel to work crew					b	
4.3. Coordinate work assignments					b	
4.4. Schedule work assignments and priorities					b	
4.5. Establish:						
4.5.1. Work methods					b	
4.5.2. Controls					b	
4.5.3. Performance standards					b	
4.6. Evaluate work performance of subordinate personnel					b	
4.7. Resolve technical problems for subordinate personnel					b	
4.8. Direct projects					b	2b
5. TRAINING TR: AFIs 36-2101, 36-2201, 36-2202; AFMAN 36-2108; AFCAT 36-2223						
5.1. Evaluate personnel to determine need for training				b	b	3c
5.2. Enlisted specialty training supervision						
5.2.1. Prepare job qualification standards					b	3c
5.2.2. Conduct training					b	3c
5.2.3. Counsel trainees on their progress					b	3c
5.2.4. Monitor training effectiveness						
5.2.4.1. Career knowledge				a	b	3c
5.2.4.2. Job proficiency upgrade				a	b	3c
5.2.4.3. Qualification				a	b	3c
5.3. Maintain training records				a	b	3c
5.4. Evaluate training programs effectiveness					b	3c
5.5. Recommend people for training					a	b

5.6. AETC training management system (Training Allocation)				A	A	B
5.7. Managing Certification and Testing (CerTest)		A		B		B
5.8. National/DoD Certification requirements	B					
5.9. AFQTP Requirements					B	
6. ENVIRONMENTAL AWARENESS AND COMPLIANCE TR: AFIs 32-4002, 32-7045, 32-7061; Chemicals in Your Community (EPA 550-K-93-003); EO 12856						
6.1. Environmental Compliance Assessment Management Program (ECAMP)		A		B	B	
6.2. National Environmental Policy Act (NEPA)		A		B	B	
6.3. Environmental Impact Analysis Process (EIAP)		A		B	B	
6.4. Emergency Planning and Community Right to Know Act (EPCRA)		A		B	B	
7. CE MANAGEMENT TR: AFI 32-1031, 32-1022; AFPAMs 32-1004 v.1, 32-1098; AFMAN 23-110						
7.1. Customer relationships		A		B	B	
7.2. Work identification and authorization				A	B	
7.3. Plan work requirements				a	b	2b
9.4. Plan logistics support (CEMAS, BOM)				a	b	2b
7.5. IMPAC Program					A	B
7.6. Maintain recurring work program				a	b	2b
7.7. Scheduling/time accounting				a	b	2b
7.8. Warranty and Guarantee Program				A	B	
7.9. Property Accountability				B		B
7.10. Base Comprehensive Plan					A	
7.11. Legal limits				A		
7.12. Mark "As Built " Drawings					b	2b
7.13. Reimbursements procedures				A	B	
7.14. CE Specific Automated Systems (Computer) Capability						
7.14.1. Perform inputs				a	b	1a
7.14.2. Maintain files				a	b	1a

7.14.3. Develop automated reports				a	b	1a
7.14.4. Extract automated reports				a	b	1a
7.14.5. Perform automated data analysis				a	b	1a
7.15. Host Tenant and Interservice Agreements					A	
7.16. Civil Engineer Civilian Management					B	C
8. COMMUNICATIONS						
TR: AFI 33-106; AFJMAN 24-306						
8.1. Use radios		b				
8.2. Use hand signals		b				
8.3. Identify airdrome signals		b				
9. AF OCCUPATIONAL SAFETY AND HEALTH (AFOSH) PROGRAM						
TR: AFPDs 91-2, 91-3; AFI 91-302; AFIND 17						
9.1. Supervisory responsibilities				B		
9.2. Hazardous materials waste handling		A		B		
9.3. Lead-based paint (LBP) hazard TR: 29-CFR 1926.62; Working With Lead-based Paint: Facts and Information Applicable to Air Force Facilities		B				
9.4. Fire extinguisher training		A				
10. PUBLICATIONS						
TR: AFI 37-160 Vol I; AFINDs 2, 9						
10.1. Military		A		B		
10.2. Commercial		A		B		
10.3. Engineering Technical Letters (ETL)		A		B		
10.2. Commercial		A		B		
10.3. Engineering Technical Letters (ETL) / Construction Technical Letters (CTL)		A		B		
11. AFS SPECIFIC TRAINING						
TR: AFPDs 91-2, 91-3; AFI 91-302; AFIND 17						
11.1. AFOSH training/standards for AFS						
11.2. Asbestos hazard		A		B		
12. AFS SPECIFIC PUBLICATIONS						
TR: TO's 0-1-01, 0-1-02, 00-2-1, 00-5-1, 00-5-2, 00-20-7						
12.1. Use indexes to locate numbers and titles of manuals, regulations, technical orders, and forms.		1a		B		
12.2. Standard publications				B		

12.3. Technical orders				B		
12.4. National Electrical Code (NFPA 70)				B		
12.5. National Electrical Safety Code				B		
12.6. Use technical publications to perform maintenance, operations, and troubleshooting		A		B		
12.7. Architectural Graphic Standards		A		B		
13. SURVEYING TR: Surveying with Construction Applications, Surveying Theory and Practice						
13.1. Manual Surveying; perform associated tasks using manual surveying equipment, such as; transits, theodolite, auto levels, steel tapes, and leveling rods						
13.1.1. Setup and tear down equipment		2b		b		
13.1.2. Complete and maintain survey field notes		2b		b		
13.1.3. Establish horizontal control	*	2b		b		
13.1.4. Measure and compute horizontal angles	*	2b		b		
13.1.5. Measure and compute horizontal distances	*	2b		b		
13.1.6. Perform traverse computations and adjustments		2b		b		
13.1.7. Establish vertical control	*	2b		b		
13.1.8. Perform level loop computations and adjustments		2b		b		
13.1.9. Perform profile and cross section leveling				B		
13.1.10. Compute and layout horizontal curve data		2b		b		
13.1.11. Compute and layout vertical curve data		2b		b		
13.1.12. Compute cross section end areas				b		
13.1.13. Compute earthwork volumes				b		
13.1.14. Set route centerline and grade stakes		2b		b		
13.1.15. Set slope stakes		2b		b		
13.1.16. Set batter boards		2b		b		
13.1.17. Perform topographic survey	*	2b		b		
13.1.18. Produce topographic map	*	2b		b		
13.1.19. Perform field tests on a transit / theodolite		2b		b		
13.1.20 Perform field adjustments on transit / theodolite				b		

13.1.21. Perform field tests on an auto level		2b		b		
13.1.22. Perform field adjustments on an auto level				b		
13.2. Automated surveying; perform associated tasks using electronic total stations and associated equipment, such as an electronic data collector						
13.2.1. Setup and tear down equipment		2b		b		
13.2.2. Setup and utilize data collection equipment		2b		b		
13.2.3 Establish horizontal and vertical control by performing a traverse survey Ref: QTP, Module 13, Surveying	◆	2b		b		
13.2.4. Download electronic survey data to a civil software package		2b		b		
13.2.5. Adjust electronic survey data using a civil software package		2b		b		
13.2.6. Perform and compute construction layout requirements		2b		b		
13.2.7. Design and plot horizontal alignment using civil software package		2b		b		
13.2.8. Design and plot vertical alignment using civil software package		2b		b		
13.2.9. Compute and plot cross sectional end areas using civil software package		2b		b		
13.2.10. Compute and plot earthwork volumes using civil software package		2b		b		
13.2.11. Set centerline, grade, and slope stakes using civil software package		2b		b		
13.2.12. Perform a topographic survey Ref: QTP, Module 13, Surveying	◆	2b		b		
13.2.13. Manipulate topographic data using a civil software package		2b		b		
13.3. Global Positioning System (GPS) surveying; perform tasks using GPS and associated equipment						
13.3.1. Setup and tear down Global Positioning System (GPS) survey equipment		2b		b		
13.3.2. Setup and utilize data collection equipment (GPS)		2b		b		
13.3.3. Perform static survey (GPS)		2b		b		
13.3.4. Perform kinematic survey (GPS)		2b		b		

13.3.5. Perform Real-Time Kinematic (RTK) survey		2b		b		
13.3.6. Download electronic data to post-processing software		2b		b		
13.3.7. Adjust electronic data using post-processing software		2b		b		
13.3.8. Utilize GPS equipment to layout routes, structures, and utilities		2b		b		
13.3.9. Utilize Precision Lightweight GPS Receiver (PLGR) for expedient survey methods				b		
14. CONSTRUCTION MATERIALS TESTS TR: AFJMAN 32-1034; ASTM Manuals 14, 15, 19; War and Mobilization Plan (WMP-1), Annex S						
14.1. Perform soils exploration and tests				b		
14.2. Classify soils				b		
14.3. Test bituminous materials				b		
14.4. Design of bituminous mixes				B		
14.5. Test concrete materials				b		
14.6. Design of concrete mixes				B		
14.7. Prepare material test reports				b		
15. DRAFTING, MANUAL TR: TM 5-581B; FM 5-553, Architectural and Graphic Standards						
15.1. Perform fundamental drafting practices	*	2b		b		
15.2. Identify / select basic American National Standards Institute (ANSI) symbols	*	2b		b		
15.3. Hand letter drawings		2b		b		
15.4. Review completed project drawings		2b		b		
15.5. Maintain drawing files		a		b		
15.6. Drawing reproduction		A		B		
15.7. Maintain engineering reproduction machine						
15.8. Update as-built drawings		2b		b		
15.9. Interpret engineering sketches		2b		b		
16. COMPUTER AIDED DESIGN (CAD) /GEOGRAPHIC INFORMATION SYSTEM (GIS) TR: Manufacturers operators manuals						
16.1. CAD fundamentals						
16.1.1. Setup drawings	*	2b		b		
16.1.2. Utilize basic drawing commands	*	2b		b		

16.1.3. Utilize display commands	*	2b		b		
16.1.4. Create and utilize symbols	*	2b		b		
16.1.5. Utilize advanced commands	*	2b		b		
16.1.6. Utilize reference files	*	2b		b		
16.1.7. Apply scaling factors	*	2b		b		
16.1.8. Perform printing and plotting	*	2b		b		
16.2. Scan drawings		2b		b		
16.3. Draw architectural plans		2b		b		
16.4. Draw structural plans		2b		b		
16.5. Draw civil plans		2b		b		
16.6. Draw mechanical plans		2b		b		
16.7. Draw electrical plans		2b		b		
16.8. CAD management						
16.8.1. Create drawing file directories		a		b		
16.8.2. Utilize Tri-service CAD standards		a		b		
16.8.3. Customize CAD platform				b		
16.9. Update as-built and record drawings		2b		b		
16.10. Geographic Information System (GIS)						
16.10.1. GIS concepts		A		B		
16.10.2. Tri-Service Spatial Data Standards (TSSDS)		A		B		
16.10.3. Develop database structures				b		
16.10.4. Populate feature codes				b		
16.10.5. Develop query routines				b		
16.10.6. Develop end-user applications				b		
17. BASE COMPREHENSIVE PLAN (BCP) PROGRAM TR: AFIs 32-1024, 32-1026, 32-7062; AFMAN 91-201						
17.1. Plan overview		A		B		
17.2. General planning criteria				B		
17.3. Airfield planning criteria	**			B		
17.4. Explosive safety criteria	**			B		
17.5. Capital improvements planning criteria				B		
18. CIVIL ENGINEERING DESIGN TR: AFJMAN 32-1049V2						
18.1. Architectural plans TR: AFM 88-3 (chaps 2 and 3)				B		
18.2. Structural plans TR: AFM 88-3 (chaps 2 and 3)				B		
18.3. Mechanical plans TR: AFJMAN 32-1046				B		

18.4. Electrical plans TR: AFM 88-9 (chaps 2 & 3)				B		
18.5. Civil plans TR: AFJMAN 32-1046				B		
18.6. Prepare materials take-offs	**			b		
18.7. Estimate cost elements such as: materials, equipment, and labor TR: Means Building Construction Cost Data	**			b		
18.8. Develop work statements TR: FAR	**			b		
18.9. Prepare project specifications using Construction Guide Specifications; Corps of Engineers Guide Specifications TR: FAR				b		
18.10. Review project specifications						
18.10.1. Identify material and equipment				b		
18.10.2. Identify method of installation and construction				b		
18.11. Prepare programming documents				b		
19. CONTRACT MANAGEMENT						
19.1. Standards of conduct TR: FAR, DoDD 5500-7 Joint Ethics Regulation		A		B		
19.2. Enforce general provisions of contracts TR: FAR	**			b		
19.3. Conduct constructibility review TR: AFI 32-1023, Construction Technical Letter (CTL) 88-7	**			b		
19.4. Document construction activities TR: AFI 32-1023, CTL 89-2	**			b		
19.5. Evaluate construction contract progress schedule TR: FAR, CTL 89-2	**			b		
19.6. Evaluate progress reports TR: FAR, CTL 89-2	**			b		
19.7. Evaluate materials submittals and test reports	**			b		
19.8. Pre-performance conference TR: AFI 32-1023, CTL 89-2				B		
19.9. Construction permits TR: AFI 32-1001				B		
19.10. Surveillance of Military Construction (MILCON) program projects TR: AFI 32-1001				B		

19.11. Quality Assurance Evaluator (QAE) duties TR: AFI 63-124						
19.11.1. Monitor service contracts	*			b		
19.11.2. Prepare Performance Work Statements (PWS)				b		
19.11.3. Prepare surveillance plans				b		
19.11.4. Prepare surveillance documents				b		
19.12. Simplified Acquisition Base Engineer Requirements (SABER) project management				B		
19.13. Project close-out procedures				B		
19.14. Warranty and guarantee program				B		
20. AFSC SPECIFIC CONTINGENCY RESPONSIBILITIES TR: AFIs 10-210; 10- 211; 32-1026; TO's 35E-5-6-1, 35E4-132-1, 35E4-94-1; Army TMs 10-8340-207-14, 10-450-200-12; WMP-1, Annex S; (Mar 95); AFPAM 10-220, Vol. 1,2, 3, 4, & 5						
20.1. Pre-attack preparations		B		B		
20.2. Airfield assessment						
20.2.1. Perform initial airfield assessment	**	2b		b		
20.2.2. Perform airfield damage assessment	*	2b		b		
20.3. Perform Explosive Ordnance Reconnaissance (EOR)	*	b		b		
20.4. Survival Recovery Center (SRC) operations		B		B		
20.5. Damage Control Center (DCC) operations		B		B		
20.6. Perform Minimum Operating Strip (MOS) selection procedures and considerations	**	2b		b		
20.7. Plot airfield damage	*	2b		b		
20.8. Perform Crater Profile Measurement (CPM) operations Ref: QTP, CD-Rom, Crater Profile Measurement	◆	2b		b		
20.9. Compute Repair Quality Criteria (RQC) for RRR TR: AFI 32-1042; AFPAM 10-220, Vol 4; TO 35E2-4-1; HQ AFCESA HST Courses of Study Vol. III		b		b		
20.10. Layout Minimum Airfield Operating Strip Marking System (MAOSMS) TR: AFPAM 10-220, Vol 4; T.O. 35E2-6-1, Ref: QTP, CD-Rom, Minimum Operating Strip Layout	◆	2b		b		

20.11. Mobile Aircraft Arresting System (MAAS) procedures TR: AFPAM 10-220, Vol 3,4 & 5; TO's 35E8-2-5-4, 35E8-2-10-3, 35E8-2-10-1S-1, 35E8-2-1-101, 35E8-2-10-1, AFI 13-217; FMs 5-430-00-2 35E8-2-11-1, 35E8-2-11-2						
20.11.1. Align MAAS Ref: QTP, CD-Rom, MAAS (or needs development)	◆	a		b		
20.11.2. Align MAAS with Lightweight Fairlead Beams Ref: QTP, CD-Rom, Lightweight Fairlead Beam	◆			b		
20.11.3. Align MAAS with standard beams with deadman anchoring system Ref: QTP, CD-Rom, MAAS (or needs development)	◆			b		
20.12. Perform facility and infrastructure damage assessment		b		b		
20.13. Combat air base planning and purpose TR: AFPAM 10-220, Vol 5; AFI 13-217; AFM 32-4004 ; AS-158, HQ AFCESA HST Courses of Study, Vol. IV Reference QTP (Bare Base Planning)						
20.13.1. Wartime planning factors		A		B		
20.13.2. Standards of construction		A		B		
20.13.3. Identify Bare Base assets	*	a		b		
20.13.4. Combat air base planning principles		A		B		
20.13.5. Facility and utility option development		A		B		
20.13.6. Air base operability assessment elements		A		B		
20.14. Expedient beddown methods TR: AFPAM 10-220, Vol 5; AFDD 36						
20.14.1. Apply Bare Base planning criteria	**	2b		b		
20.14.2. Perform site selection	**	2b		b		
20.14.3. Establish dispersed layout		b		b		
20.14.4. Establish non-dispersed layout	**	2b		b		
20.14.5. Shelter orientation		A		B		
20.14.6. Aircraft revetment siting TR: AFPAM 10-220, Vol 2; AFMAN 32-1071; AFDD 2-4.2; AFM 32-4005		A		B		
20.15. Perform soils exploration under field conditions TR: AFM 32-4004; AFIs 13-217, 3-101, Vol 1				b		
20.16. Classify soils under field conditions				b		

20.17. Determine field California Bearing Ratio (CBR) using Dynamic Cone Penetrometer (DCP) Ref: QTP needs development	◆	1a		b		
20.18. Force protection engineering considerations and measures	**			B		
20.19. Aircraft parking planning				B		
20.20. High Mobility Multi-Wheeled Vehicle (HMMWV)				B		
20.21. Cardiopulmonary resuscitation (CPR)						
20.22. Decontamination apparatus				B		
21. GENERAL CONTINGENCY RESPONSIBILITIES TR: AFIs 10-201;10-207; 10-210, 10- 211, 32-1026; 32-7062; AFH 32-4011, Vol 1; T.O.s 35E-5-6-1, 35E4-132-1, 35E4-94-1; Army TMs 10-8340-207-14, 10-450-200-12; War Mobilization Plan (WMP)-1, Annex S; AFPAM 10-219, Vol 1- 10						
21.1. Prime BEEF (PB) Orientation TR: AFDD 42; AFIs 31-209,10-403; 51-401; AFPD 51-4; AFCESA/CEX - Prime BEEF Equipment Supply List (ESL); Home Station Training (HST) / Readiness Training Package (RTP) A -6; Geneva Convention Articles						
21.1.1. The Prime BEEF (PB) Program		A				
21.1.2. Civil Engineer Doctrine		A				
21.1.3. The Prime BEEF organization		A				
21.1.4. Code of Conduct		A				
21.1.5. The Law of Armed Conflict		A				
21.1.6. The Prime BEEF equipment requirements						
21.1.6.1. Consolidated tool kits (CTK)		A				
21.1.6.2. Issue		A				
21.1.6.3. Storage requirements		A				
21.1.6.4. Mobility bags		A				
21.1.6.5 Weapons TR: AFIs 10-210, 31-101, 31-207; 36-2226, 91-202; AFH 31-223; AFPAM 10-219, Vol 8						
21.1.6.5.1. Issue		A				
21.1.6.5.2. Control		A				
21.1.6.5.3. Courier		A				

21.1.6.6. Team kits		A				
21.1.6.7. Body armor		A				
21.1.6.8. Tactical communication system		A				
21.1.7. Individual responsibilities		A				
21.1.8. Accountability		A				
21.1.9. Marshal Equipment and Personal		A				
21.2. First Aid Techniques TR: AFIs 36-2238, 32-4001, 48-110; AFH 36-2218, Vol 2; Emergency Care and Transportation of the Sick and Injured						
21.2.1. Individual's responsibilities for administering first aid		A				
21.2.2. Self aid and buddy care concept		A				
21.2.3. Know the basic lifesaving steps:						
21.2.3.1. Establish unresponsiveness		A				
21.2.3.2. Ensure an open airway		A				
21.2.3.3. Ensure breathing & circulation		A				
21.2.3.4. Stop bleeding		A				
21.2.3.5. Prevent/Treat for shock		A				
21.2.3.6. Protect wound by applying dressing, bandaging, & splinting		A				
21.2.4. Move and transport injured personnel		A				
21.3. Field Sanitation & Hygiene Measures TR: AFIs 48-110, 10-210; AFDD 35; ARMY FM 21-10; HST/RTP						
21.3.1. Personal hygiene measures		A				
21.3.2. Countermeasures for:						
21.3.2.1. Disease and pestilence		A				
21.3.2.2. Communicable diseases		A				
21.3.3. Sanitation requirements for:						
21.3.3.1. Field		A				
21.3.3.2. Kitchen & Mess		A				
21.4. Self Protection from Extreme Weather TR: Medical Aspects of Cold Weather Operations US Army Research Institute Report TN 93-4 and 92-2; AFPAM 10-219, Vol 5; Army FM 21-76						
21.4.1. Hot weather survival techniques						
21.4.1.1. Acclimatization		A				
21.4.1.2. Sun protection		A				
21.4.1.3. Heat exertion		A				

21.4.1.4. Dehydration		A				
21.4.1.5. Heat stroke		A				
21.4.2. Cold weather survival methods						
21.4.2.1. Wearing of clothing		A				
21.4.2.2. Immersion foot		A				
21.4.2.3. Frost bite		A				
21.4.2.4. Hypothermia		A				
21.4.2.5. Trench foot		A				
21.4.2.6. Wind chill factor		A				
21.5. Force Protection TR: Joint Pub 1-02; AFH 32-4014, Vol 4; AFH 10-222, Vol 3; AFPAM 10-219 Vol 2; DoD 0-2000.12-H; Joint Services Guide 5260						
21.5.1. Personal / Work Party Security TR: AFIs 36-2226, 36-2209, 31-209, 31-301, 10-403, 10-404, 31-207, 10-215; AFPAM 10-219, Vol 3 ; Army FMs 21-75; 7-8						
21.5.1.1 Combat skills		A				
21.5.1.2. Defensive tactics						
21.5.1.2.1. Cover and concealment		A				
21.5.1.2.2. Individual movement		A				
21.5.1.2.3. Weapons fire control		A				
21.5.1.2.4. Communications		A				
21.5.1.2.5. Field fortifications		A				
21.5.1.2.6. Guard placement/perimeter defense		A				
21.5.1.2.7. Recognition code system		A				
21.5.2. Air Base Defense (ABD) Interface TR: AFIs 31-301, 31-702; DoD 50002.2; HST/RTP A						
21.5.2.1. Ground threats		A				
21.5.2.2. ABD concept		A				
21.5.2.3. Defensive tactics		A				
21.5.2.4. Force movement		A				
21.5.2.5. Weapons and fire control		A				
21.5.2.6. Tactical barriers		A				
21.5.2.7. Fighting/Protective Positions		A				
21.5.3. Convoy Techniques TR: AFIs 36-2209, 31-301, 10-211, 36-2225, 31-101, Vol 1; AFMAN 24-309; AFPAM 10-219, Vol 3; Army FMs 7-8, 7-10, 55-30; HST/RTP I						
21.5.3.1. Convoy principles						
21.5.3.1.1. Organization		A				
21.5.3.1.2. Command and control		A				

21.5.3.1.3. Vehicle preparation		A				
21.5.3.1.4. Security Forces interface		A				
21.5.3.1.5. Counter ambush techniques		A				
21.5.3.1.6. Defensive ambush measures		A				
21.5.4. Passive Defense Techniques TR: AFPAM 10-219, Vol 2 & 5; AFIs 10-210, 10-11, 10-212, 32-4001, 31-101, 31-209, 31-210, 10-401, 31-301; TM 5-1080-200-13/P; AFH 31-302; AFMAN 32-4005; AFPDs 31-1, 71-1; AFMD 39; AFDD 2-4.2; Instructions for Assembly and Erection of (Type A1 and B1) Aircraft Revetment Kit						
21.5.4.1. Hardening/splinter protection						
21.5.4.1.1. Intent of hardening protection		A				
21.5.4.1.2. Resource protection		A				
21.5.4.1.3. Candidate requirements		A				
21.5.4.1.4. Hardening techniques		A				
21.5.4.2. Aircraft revetment TR: AFPAM 10-219, Vol 2; AFMAN 32-1071; AFDD 2-4.2; AFM 32-4005; AFIs 31-101, 31-209, 31-210, 10-401, 31-301						
21.5.4.2.1. Assemble kit-type revetments						
21.5.4.2.1.1. A-1		A				
21.5.4.2.1.2. B-1		A				
21.5.4.2.1.3. ARMCO		A				
21.5.4.2.1.4. Concertainer		A				
21.5.4.2.2. Impoverished revetments like:						
21.5.4.2.2.1. Drums		A				
21.5.4.2.2.2. Sandbags		A				
21.5.4.2.2.3. Berms		A				
21.5.4.3. Resource dispersal						
21.5.4.3.1. Purpose of resource dispersal		A				
21.5.4.3.2. Types of resources normally dispersed		A				
21.5.4.3.3. Types of dispersal sites		A				
21.5.4.3.4. Dispersal operations		A				
21.5.4.4. Camouflage, Concealment, and Deception (CCD) Techniques TR: AFPAM 10-219, Vol 2 & 3; AFCESA/CEX - CCD ConOps; HST-RTP K1, DPT K1, RTP K3, DPTP K3, RTP K9, DPTP K9, & RTP K11						
21.5.4.4.1. Basic CCD practices		A				
21.5.4.4.2. Types of CCD techniques		A				
21.5.4.4.3. Planning considerations		A				

21.5.4.5. Terrorism TR: AFI 31-210, AFPAM 10-219, Vol 2; Joint Pub 1-02; AFDD 35/36						
21.5.4.5.1. Awareness		A				
21.5.4.5.2. Countermeasures		A				
21.5.4.6. Chemical warfare protection TR: AFMAN 32-4005; 24-309; AFIs 10-203, 10-210, 13-218, 21-101, 32-4001; AFPAM 10-219, Vol 3 & 4; AFH 32-4014, Vol 2; AFMAN 32-4005, Vol 2, HST-RTP C11 & RTP B3						
21.5.4.6.1. Individual protective equipment						
21.5.4.6.2. Wartime threat / protective actions / procedures		A				
21.5.4.6.3. Decontaminating vehicle / equipment		A				
21.5.4.6.4. Decontaminate shelter entry point		A				
21.5.4.6.5. Know USAF standard alarm signals TR: AFPAM 10-219, Vol 2; , HST/RTP C5		A				
21.5.4.6.6. Protective shelters						
21.6. Base Denial TR: AFIs 10-210, 10-211; AFPAM 10-219, Vol 3; Army FM 5-250; TO 11A-1-66; HST/RTP; WMP-1, Annex S						
21.6.1. Base denial concept		A				
21.6.2. Denial methods						
21.6.2.1. Fire		A				
21.6.2.2. Explosives		A				
21.6.2.3. Component removal		A				
21.6.2.4. Sabotage		A				
21.6.2.5. Mechanical destruction		A				
21.7. Multi-Contingency / Warskills Training Requirements TR: AFI 10-210; WMP-1, Annex S						
21.7.1. Multi-warskilling concept		A				
21.7.2. Vehicle Qualifications TR: AFI 10-210; AFPAM 10-219, Vol. 3, 4, 8; AFPD 25-1; AFMAN 24-309; AFI 23-101; 25-101; AS 12; T.O.s 36A2 series, 36M2 series, 36A12 series; War & Mobilization Plan (WMP), Vol. I, Annex S; HST/RTP						
21.7.2.1 Contingency vehicles and equipment responsibilities		A				

21.7.2.1. Civil engineer contingency vehicle operations		A				
21.7.2.2 Obtain government driver's license		A				
21.7.2.3. Qualify on contingency vehicles		A				
21.7.2.4. General purpose vehicles (up to 14,000 GVW)		A				
21.8. Auxiliary Structural Fire Fighting TR: AFIs 10-210, 32-2001; AFH 32-4014, Vol 3; WMP-1, Annex S; International Fire Service Training Association (IFSTA) Manuals						
21.8.1. Civil engineer auxiliary fire fighting concepts		A				
21.8.2. Basic fire fighting principles						
21.8.2.1. Classes of fire		A				
21.8.2.2. Types of extinguishers		A				
21.8.2.3. Fire reporting procedures		A				
21.8.2.4. Evacuation procedures		A				
21.8.2.5. Structural fire fighting		A				
21.8.2.6. Wildlands fires		A				
21.8.3. Equipment and safety factors						
21.8.3.1. Utility isolation		A				
21.8.3.2. Agent/water application		A				
21.8.3.3. Building heat and smoke ventilation		A				
21.8.3.4. Rescue principles		A				
21.8.3.5. Using extinguishers		A				
21.8.3.6. Installed standpipe system		A				
21.8.3.7. Fire hydrant/hose operation		A				
21.8.3.8. Ladder operation		A				
21.8.3.9. Portable pumps		A				
21.8.3.10. Water distribution truck		A				
21.8.3.11. Emergency Alarm system		A				
21.9. Explosive Ordnance Reconnaissance (EOR) TR: AFI 10-210; AFPAM 10-219, Vol 3 & 4; Army FMs 21-16, 21-75						
21.9.1. Potential ordnance		A				
21.9.2. Marking procedures		A				
21.9.3. Reporting procedures		A				
21.9.4. Mass ordnance clearance		A				

21.10. Beddown shelters TR: T.O.s 35E-5-6-1, 35E4-132-1, 35E4-94-1; TM 10-4500-200-13; AFI 10-219, Vol 2, 3 & 5						
21.10.1. Bare base concept		A				
21.10.2. Beddown package assets						
21.10.2.1. Harvest Eagle		A				
21.10.2.2. Harvest Falcon		A				
21.10.2.3. Temper Tent TR: AFPAM 10-219, Vol 2, 5; AFH 10-222, Vol 1; T.O. 35E5-1-6						
21.10.2.3.1. Assemble		A				
21.10.2.3.2. Erect		A				
21.10.2.3.3. Inspect		A				
21.10.2.3.4. Maintain		A				
21.10.2.3.5. Disassembly		A				
21.10.2.3.6. Storage		A				
21.10.2.4. Alaska Small Shelter System (AKSSS) TR: T.O. 35E5-6-11						
21.10.2.4.1. Erect		A				
21.10.2.4.2. Inspect		A				
21.10.2.4.3. Maintain		A				
21.10.2.4.4. Disassemble		A				
21.10.2.4.5. Storage		A				
21.10.2.4.6. Electrical		A				
21.10.2.4.7. Environmental Control Unit (ECU)		A				
21.11. Rapid Runway Repair (RRR) TR: AFIs 10-210, 10-211, 10-212; T.O.s 35E2-3-1, 35E2-2-7, 35E2-5-1; AFPAM 10-219, Vol 4						
21.11.1. Base Recovery concepts		A				
21.11.2. Damage assessment		A				
21.11.3. Damage reporting		A				
21.11.4. Rapid Runway Repair (RRR) concept						
21.11.4.1. RRR Philosophy		A				
21.11.4.2. AM-2 Matting		A				
21.11.4.3. Fiberglass Mat						
21.11.4.3.1. Assembly		A				
21.11.4.3.2. Anchor		A				
21.11.5. Spall Repair		A				

QUALITATIVE REQUIREMENTS

PROFICIENCY CODE KEY		
	Scale Value	Definition: The individual
Task Performance Levels	1	Can do simple parts of the task. Needs to be told or shown how to do most of the task. (Extremely limited)
	2	Can do most parts of the task. Needs only help on hardest parts. (PARTIALLY PROFICIENT)
	3	Can do all parts of the task. Needs only a spot check of completed work. (COMPETENT)
	4	Can do the complete task quickly and accurately. Can tell or show others how to do the task. (HIGHLY PROFICIENT)
Task Knowledge Levels *	a	Can name parts, tools, and simple facts about the task. (NOMENCLATURE)
	b	Can determine step by step procedures for doing the task. (PROCEDURES)
	c	Can identify why and when the task must be done and why each step is needed. (OPERATING PRINCIPLES)
	d	Can predict, isolate, and resolve problems about the task. (COMPLETE THEORY)
Subject Knowledge Levels **	A	Can identify basic facts and terms about the subject. (FACTS)
	B	Can identify relationship of basic facts and state general principles about the subject. (PRINCIPLES)
	C	Can analyze facts and principles and draw conclusions about the subject. (ANALYSIS)
	D	Can evaluate conditions and make proper decisions about the subject. (EVALUATION)

EXPLANATIONS

* A task knowledge scale value may be used alone or with a task performance scale to define a level of knowledge for a specific task. (Example: "b" and "1b")

** A subject knowledge scale value is used alone to define a level of knowledge for a subject not directly related to any specific task, or for a subject common to several tasks.

- This mark is used instead of a scale value to show that no proficiency training is required in the course.

X This mark is used alone in course columns to show that training is required but not given due to limitations in resources.

MEMORANDUM FOR RECORD

SUBJECT: Course Training Standards

4 Oct 2000

1. The following items are being addressed either through the new line items in the Course Training Standards or added into current line items:

Contract Construction Inspector (J4AST3E571 000) will add a project closeout lesson within the documentation of construction section. During the U&TW they asked that asphalt and a runway stripping lesson be added to section 7. Asphalt is covered in the testing section (6) and in site work in section 7. A lesson on runway stripping will be added to the course. Another item addressed at the U&TW was adding a lesson on ESCOHCAMP in section 8. A lesson will be developed. There will be additional time needed because of these additional lessons. Developing read ahead material for this course would be my suggestion to remedy the time constraint problem. There are no other constraints.

Construction Materials Testing (J3AZP3E571 001) will develop read ahead material so more hands on training can take place. Soils stabilization and Dynamic Cone Penetrometer lessons will also be added in place of time gained from utilizing read ahead material. There will be no time added to the course as well as no constraints.

Engineering Design (J3AZP3E571 003) will add a lesson for developing construction project work statements. There will be no time added to the course as well as no constraints.

Construction Surveying (J3AZP3E571 004) will develop read ahead material to replace knowledge level lessons on mathematics, horizontal and vertical curves, gradeline, and earthwork computations so more hands on training can take place. All survey lessons will benefit from the addition hands on time. Some of these areas will require additional development to assure these benefits. There will be no time added to the course as well as no constraints.

2. Minor errors found at U&TW were corrected on all Course Training Standards.

DONALD PROHASKA JR, TSgt, USAF
Engineering Curriculum Developer

(Engineering Design)
CTS J3AZP3E571 003

QUALITATIVE REQUIREMENTS

Tasks, Knowledge, and Proficiency Level

- | | |
|---|----|
| 1. Perform data extraction from government and commercial publications. | 2b |
| 2. Air Force Comprehensive Planning | |
| a. Describe the contents of the Comprehensive Plan | B |
| b. Describe the requirements for the Comprehensive Plan. | B |
| 3. Using preliminary design criteria and develop sketches for: | |
| a. Architectural plans | 2b |
| b. Structural plans | 2b |
| c. Mechanical plans | 2b |
| d. Electrical plans | 2b |
| e. Civil plans | 2b |
| 4. Produce material and equipment takeoffs for a civil engineering construction project. | |
| | 2b |
| 5. Specify methods of material installation and facility construction for a civil engineering construction project. | |
| | B |
| 6. Produce programming documents and basic cost estimates. | |
| | 2b |

SUMMARY OF CHANGES

This CTS was updated as a result of the Jul 00 U&TW. The CTS was also changed from Behavioral Statements to the Proficiency Code Key (PCK) format.

(Construction Materials Testing)
CTS J3AZP3E571 001

QUALITATIVE REQUIREMENTS

Tasks, Knowledge, and Proficiency Level

1. SOILS TESTS

- | | |
|--|----|
| a. Perform soils exploration. | 2b |
| b. Classify soils under field conditions. | 2b |
| c. Classify physical properties of soil. | 2b |
| d. Perform soils tests in lab for engineering properties. | 2b |
| e. Perform soils tests in field for engineering properties and layer structure | 2b |
| f. Specify method for soils stabilization | B |

2. PAVEMENT TESTS

- | | |
|--|----|
| a. Perform bituminous material tests. | 2b |
| b. Produce preliminary design for bituminous mixes | 2b |
| c. Produce preliminary design for concrete mixes | 2b |
| d. Perform concrete material tests and correlate the results with contract specifications. | 2b |
| e. Produce materials test reports. | 2b |

SUMMARY OF CHANGES

This CTS was updated as a result of the Jul 00 U&TW. The CTS was also changed from Behavioral Statements to the Proficiency Code Keys (PCK) format.

(Construction Surveying)
CTS J3AZP3E571 004

QUALITATIVE REQUIREMENTS

Tasks, Knowledge, and Proficiency Level

1. MATHEMATICS

- a. Demonstrate knowledge of basic Trigonometry and Geometry. 2c
- b. Demonstrate knowledge of Azimuths and Bearings. 2c
- c. Demonstrate knowledge of Coordinate Systems. 2c

2. RECONNAISSANCE SURVEYS

- a. Perform site reconnaissance. 2b
- b. Produce reconnaissance report. 2b

3. VERTICAL CONTROL

- a. Perform differential leveling. 2b
- b. Perform Field Data Recording. 2b
- c. Perform calculations and Adjust Level Loop. 2b

4. HORIZONTAL CONTROL

- a. Produce Control Points with GPS survey. 2b
- b. Perform a traverse with a total station. 2b
- c. Perform data download to a civil software application. 2b
- d. Perform calculations and adjust the traverse with civil software application. 2b

5. TOPOGRAPHY BY RADIAL METHOD

- a. Perform radial survey with total station/GPS. 2b
- b. Perform data download to civil software application. 2b
- c. Produce site map with civil software application. 2b

6. ROAD LAYOUT SURVEYS

- e. Perform horizontal curves, vertical curves, grade line
computations and earthwork volumes. 2b
- b. Design road using civil software application. 2b
- c. Perform data upload data to total station. 2b
- d. Perform road stakeout. 2b

7. BUILDING LAYOUT

- a. Perform adjustments on conventional survey equipment. 2b
- b. Perform building layout using total station and conventional survey
equipment. 2b

8. UTILITY SURVEYS

- a. Perform utility layout lines using a total station. 2b

SUMMARY OF CHANGES

This CTS was updated as a result of the Jul 00 U&TW. The CTS was also changed from Behavioral Statements to the Proficiency Code Keys (PCK) format.

(Contract Construction Inspector)
CTS J4AST3E571 001

QUALITATIVE REQUIREMENTS

Tasks, Knowledge, and Proficiency Level

1. Associate the working relationship contract inspector personnel must maintain with base contracting personnel, the contractor, and the using agency. B
2. CONTRACT DOCUMENTS
 - a. Interpret the general provisions of a construction contract. B
 - b. Perform interpretation of working drawings. 2b
 - c. Perform interpretation of technical specifications. 2b
 - d. Perform interpretation of construction contract (SF 1442). 2b
3. PRE-CONSTRUCTION ACTIVITIES
 - a. Perform a constructibility review. 2b
 - b. Perform evaluation of a contract progress schedule. 2b
 - c. Perform evaluation of material submittals. 2b
 - d. Specify the inspector's responsibilities prior to and during a pre-performance conference. B
 - e. Specify the requirements for preparing a Base Civil Engineering Work Clearance Request (AF Form 103) 2b
 - f. Specify the inspector's responsibilities relating to government furnished equipment/government furnished material. B
4. DOCUMENTATION OF CONSTRUCTION
 - a. Draft entries in the inspector's diary (AF Form 1477). 2b
 - b. Draft a progress report. 2b
 - c. Specify the requirements for contract modifications. B

- d. Draft non-compliance correspondence related to a construction contract. 2b
- e. Specify the requirements for as-built drawings. B
- f. Perform construction project closeout 2b

5. ACCEPTANCE PROCEDURES

- a. Specify the requirements for conducting surveillance inspections. B
- b. Specify the requirements for participating in preliminary inspections. B
- c. Specify the requirements for participating in final acceptance inspections. B
- d. Specify the requirements for preparing a punch list of construction deficiencies. B
- e. Define Contract Management's role in the warranties and guarantees program. B
- f. Specify the requirements for conducting post-acceptance inspections. B

6. CONTRACT REFERENCED TESTING

- a. Produce soil tests results B
- b. Produce asphalt tests results B
- c. Explain test procedures on freshly mixed concrete samples B
- d. Explain test procedures on concrete test specimens B
- e. Produce hardened concrete test results B

7. SPECIFY INSPECTION REQUIREMENTS FOR CONSTRUCTION MATERIALS AND METHODS TO INCLUDE:

- a. Site work B
- b. Concrete B
- c. Masonry B
- d. Metals B

e. Woods	B
f. Thermal and moisture protection	B
g. Doors and windows	B
h. Finishes	B
i. Mechanical	B
j. Electrical	B
k. Runway stripping	B

8. ENVIRONMENTAL COMPLIANCE AWARENESS

a. Specify Environmental Compliance and Assessment Management Program (ECAMP) protocols.	B
b. Specify basic inspection requirements for asbestos removal.	B
c. Specify basic inspection requirements for lead based paint removal.	B
d. Specify basic inspection requirements for underground storage tank removal.	B
e. Specify basic inspection requirements for Polychlorinated Biphenyl (PCB) removal and disposal.	B

NOTE: The use of Federal, Air Force, Army and commercial publications and industrial standards from which to extract data has been integrated into every applicable phase of training.

SUMMARY OF CHANGES

This CTS was updated as a result of the Jul 00 U&TW. The CTS was also changed from Behavioral Statements to the Proficiency Code Key (PCK) format.

ACTION ITEMS

ITEM	OPR/OCR	ECD	COMP DATE
1. Submit AFMAN 36-2108 changes to AFPC/DPPAC STATUS: Closed	OPR: HQ AFCESA/CEOT SMSgt Skinner	April 01	Submitted Sep 00
2. Make necessary changes to CFETP/STS as specified by workshop members STATUS: Open	OPR: 366th TRS/TRR Mr. Glenn Moret OCR: HQ AFCESA/CEOT SMSgt Skinner	Nov 00	
3. Finalize new CFETP & submit to AFPC/DPPAT STATUS: Open	OPR: 366th TRS/TRR Mr. Glenn Moret OCR: HQ AFCESA/CEOT SMSgt Skinner	Nov 00	
4. Submit all changes to AFCAT 36-2223 to AFPC/DPPAT STATUS: Open	OPR: 366th TRS/TRR Mr. Glenn Moret	Nov 00	
5. Complete apprentice course development. Implement first class. STATUS: Open	OPR: 366th TRS/TRR Mr. Glenn Moret	Jan 02 Mar 02	
6. Complete CDC development for AFIADL review. Deliver to field. STATUS: Open	OPR: 366th TRS/TRR Mr. Jim Phillips	Dec 01 Apr 02	
7. Make all changes to supplemental courses and changes to the ETCA STATUS: Open	OPR: 366th TRS/TRR Mr. Glenn Moret	Nov 00	
8. Review all 3E551 AFQTP's and modify to match new core task STATUS: Open	OPR: HQ AFCESA/CEOT SMSgt Skinner	Nov 00	

JULY 00 3E5X1 U&TW RESULTS
(Engineering)

	<u>Before U&TW</u>	<u>After U&TW</u>
<u>Core tasks</u>		
5-level tasks	11	21
Certified at school	0	0
7-level tasks	10	17
Certified at school	0	0
<u>Total core tasks</u>	21	38
*Diamond Tasks	4	8
Certified at school	0*	0**
Total core tasks requiring certification at duty location	25	46

OVERALL RESULTS: Prior to the U&TW, 21 core tasks required certification at the duty location. After the U&TW, 38 core tasks require certification at the duty location. The previous four diamond tasks were broken into smaller tasks that resulted in an increase of diamond tasks. The U&TW members did a great job identifying the true war tasks training requirements and concentrated on breaking the previous core task into several sub tasks. Therefore, what appears to be an increase in core task is actually a reduction.